

# CHARLESTON HARBOR PROJECT: RESIDENT ATTITUDE STUDY

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## **EXECUTIVE SUMMARY**

The purpose of this study was to assess and report the perceptions and attitudes of residents of Berkeley, Charleston, and Dorchester Counties, S.C. toward environmental resource and growth issues, with emphasis on the aquatic resources and habitats. The specific objectives were: (1) to determine the perception toward various natural, environmental, and social resource issues of the Greater Charleston Harbor Area among tri- county residents; (2) to determine the importance placed on various scenic, cultural, and natural resources of the area; (3) to assess the degree to which residents have noticed change in resource conditions over time, and their feelings toward the development of a regional management plan; and (4) to determine any inconsistencies in attitude between subgroups of the population by comparing sociodemographic categories within respect to specific variables.

A random digit dialing telephone survey of 350 tri-county residents was conducted in July 1997 at Clemson University. The survey was voluntary. Of the 743 residents who were contacted, 393 individuals refused to participate in the study, resulting in a 47% response rate. Respondents rated 16 natural resource and environmental management issues on a 5-point agreement scale, 6 scenic/cultural/natural area issues on a 5-point importance scale, and provided background information on 10 sociodemographic variables. Initial data analysis consisted of computing frequencies (number and percent of responses) and descriptive statistics (means and standard deviations) of the survey variables. Further data analysis consisted of inferential statistical tests to determine whether or not socio- demographic subgroups of the population differed significantly in their attitude toward the issues under discussion.

It was found that 139 (39.7%) respondents came from Charleston county, 111 (31.7%) from Dorchester county, and 100 (28.6%) from Berkeley county. Most respondents were long-term residents, averaging about 21 years in the tri-county area. Less than 7% owned waterfront property and less than 3% owned boat docks. The majority of respondents were college educated, actively employed, and had household incomes in the \$20,000 to \$60,000 range. The 36-55 age category had the most respondents.

Responses to the 16 management issues indicate that residents overwhelmingly agree that protection of the environment is important. Residents are in favor of protecting both wetlands and the habitat of shoreline nesting birds, even if it would incur a cost to themselves in terms of less access to these areas. They are in favor of development restrictions when necessary to protect wetlands and local fisheries. Residents feel that historical and archeological sites are also important and should be protected. They are supportive of community boat docks that would lessen the impact of private ones on the environment. There is concern that the water in the Harbor and surrounding rivers and creeks is not clean and safe for swimming and that it might not support a healthy fishery in the future. This is noteworthy since they indicate that it is important to them that there be locally caught fish and shellfish that are safe for human consumption. This was the management issue on which residents had the strongest feelings.

Residents of the tri-county area generally do not feel that the benefits of growth and development outweigh the negative consequences to wetlands, water quality, and fisheries. They believe that growth should only be supported if it is done in an ecologically acceptable manner. Therefore, it is not surprising that they are in favor of a regional management plan that would

protect environmental resources while allowing needed growth and development. Interestingly, residents of the tri-county area do not seem to blame tourism for causing the growth and development which concerns them. They recognize that tourism has improved the economy and would like to see it continue as a major industry in the area. Perhaps there is an awareness that tourism is a cleaner industry than many others.

Scenic and cultural vistas, and natural areas were important to residents, and were frequently rated as very important. It made little difference if the vistas were of the Charleston Harbor, marshes, wetlands, forests or scenic byways. All were rated important or very important. Respondents also felt a regional management plan that would create natural vegetation buffer zones was very important to protect these visual resources, as well as to protect fishery habitats.

Because residents were rather homogeneous in how they rated the management issues, there were few significant differences found in how different sub-segments of residents felt about the issues. More educated and longer term residents generally tended to have stronger opinions about most management issues. Senior citizens (over 55 years) tend to feel less strongly about certain issues. It must be noted that many of the senior citizens said that they were unable to get out to enjoy the scenic areas and, therefore, responded neutrally or negatively when asked if they frequently visited scenic or cultural attractions. However, there was still a significant difference in the strength of their feelings about the importance of protecting historical and archeological sites, as well as the need for a regional management plan. Although there was a statistically significant difference in the responses of those over 55 from the rest of the age

groups, it is important to note that all residents agreed that these resources are important and should be protected by a regional management plan. It is especially important to note that in the case of all differences, the difference is only in the extent of the opinion and not the direction of the opinion. Both overall as well as in subgroups, the respondents were very positive in their attitudes toward the value of and the protection of the environment.

It was of particular interest for this study to determine if residents of the tri-county area perceived any change in the abundance of edible fish and shellfish during their residency in the area. About an equal number of respondents felt that the edible fish had decreased (39.7%) or stayed the same (32.0%) during their residence. Only 5.7% felt that there had been an increase in the amount of edible fish. Many residents (22.6%) felt that they simply did not know whether there had been a change in abundance of edible fish. Opinions on this question are likely to vary with how long respondents have lived in the area. Although there was a significant difference between length of residence and their opinion about change in abundance of edible fish, it is difficult to interpret these results in a meaningful manner. The most that can be inferred is that perceptions differ in this regard and that length of residency is not a determining factor in regard to these perceptions. Since these results are somewhat inconclusive, perhaps it is more important to emphasize that responses to other questions indicate residents are concerned about the health of the fishery, both now and for the future. They clearly indicated their belief that water resources are not safe now and need protection for the future.

Conclusions are provided, based on the available data. However, there are limitations to the statements. One limitation is that this data is specific to tri-county residents and must be

considered with that in mind. This survey explored several resource management issues. The issues addressed provide valuable information as to the perceptions and attitudes of a randomly selected sample of residents of the tri-county area on these issues. However, an additional limitation of this study is that the results presented in this report are of those respondents who were willing to participate in the survey. Therefore, the results may not reflect opinions of residents who were not at home or who refused to participate. As a result, caution should be exercised in extrapolating results to the broader population.

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Finally, we thank the 350 residents of the Greater Charleston Area who cared enough about the future to share their views with us.

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## INTRODUCTION

Sustainable development should be the goal of both planners and residents when confronted with issues of growth within the community. Sustainable development was defined by the Brundtland Commission (1987) as development which meets the needs of the present without compromising the ability of future generations to meet their own needs. The Commission contended that sustainable development has a very political agenda, in that it is a process in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change should all be in harmony, and enhance both current and future potential to meet human needs and aspirations. As Redclift (1991) asserts, the important thing to notice about this approach is that it regards sustainable development as a policy objective and goal. This places the responsibility for problems and the political will to overcome them in the hands of local residents.

Gill and Williams (1994) contend that growth management is the most appropriate method for achieving sustainable development. Growth management plans offer a guidance system to implement the vision that a community has of its desired growth. The goal of growth management is to enhance the benefits of growth while mitigating the consequences. Recognition that growth is a local concern is central to the concept. While there is no one set of appropriate techniques for growth management, land use planning in which various aspects of growth are used to enhance the positive and limit the negative impacts of growth is the central component of a growth management approach. Growth management tools include impact analyses (e.g., environmental impact analysis, carrying capacity analysis, social impact analysis) and regulatory systems (environmental controls, development right transfers, zoning uses).

As part of developing a growth management plan for sustainable development, opinions of the residents within the affected community must be taken into consideration. Therefore, research into the attitudes of residents toward various development issues is a vital element of the planning process and a method of mitigating adverse social impacts.

One component of a competent community in which the community is able to cope with changes or problems is that it achieves a working consensus on goals and priorities (Ayres and Potter 1989). According to Ritchie (1985), a reasonable degree of consensus between residents and members of the business community about the desired direction of development is an important ingredient of long term success in achieving sustainability development. The need to attain and maintain complementary views among residents of the community concerning the nature and level of development in order to achieve a consensus on growth issues is widely recognized (Cook 1982, Lin, Sheldon and Var 1987, Murphy 1983, Ritchie 1988). Consensus is particularly important when changes within a community are under consideration. Positive attitudes on the part of both leaders and residents toward any change within a community are important. Any significant difference in attitudes toward change will make it more difficult to initiate and implement any local action successfully (Ayres and Potter 1989). Therefore, proactive consensus building at an early planning stage in the growth and development process of a community is always preferable to reactive conflict resolution.

Tourism is frequently the engine that drives development and growth within communities. Many studies have been conducted that assess the attitudes of residents toward the impacts of tourism on the community. One of the first of these studies (Rothman 1978) was

conducted in two beach resort communities. It was found that virtually every aspect of community life is affected in some way by tourism, resulting in changes of patterns of behavior by residents. The residents were generally satisfied with their communities, with this being attributed to the economic benefits from tourism and the extended period of time in which residents had been coping with tourism. However, it is possible that tolerance of the impacts of tourism in this instance was related to the seasonal nature of the industry, since another study conducted the same year had conflicting results. A study of the residents of Cape Cod by Pizam (1978) found substantial support for the hypothesis that heavy tourism concentration on a destination area leads to negative resident attitudes toward tourism development.

The social implications and costs of tourism development were the focus of a study of two Canadian cities by Cheng (1980). It was found that with increased tourism development community values and objectives may change. Incremental change is rarely controlled, and therefore, becomes problematic from a planner's viewpoint. The significance of incremental change is that it involves many decision-makers who are interested in starting projects, not in halting development. The role of government is reflected in policies that favor tourism development, which tends to increase the pressures on host communities by stimulating incremental development. While entrepreneurs are usually ready to seize opportunities for tourism development, a valued quality of life may be lost for residents if the development process goes too far. Uncoordinated growth cannot be assumed to be a blessing for everyone. Therefore, community values and goals need to be identified, with the social consequences of different levels of tourism development evaluated against these values and goals. A community-

oriented plan as opposed to a business-oriented plan should be selected and implemented. The study points out the potential for differences in attitudes toward development depending on the amount of economic or political benefits to be gained. Economic benefit to the community is usually the cornerstone for support for development and growth. However, the economic benefits may not outweigh the social and environmental costs to the community.

Also of concern, when implementing sustainable resource and growth development at the local level are differences in the perceptions and importance that resource managers and local residents have for resource issues. Several resource management studies have shown differences in how professional resource managers and the public perceive resource issues and even sustainable development ( Clark, Hendee, and Campbell 1971, Driver 1974, Harris 1979, Hendee and Harris 1970, LaPage 1983, Lucas 1964, Moeller, Larson and Morrison 1974, Peterson 1974, Wellman, Dawson and Roggenbuck 1982). The studies have also shown that resource managers are often incorrect in their perception of how they think the public perceives or will perceive certain resource management issues.

Two of the earliest studies illustrate the differences that recreation resource managers and visitors can have with respect to the values of outdoor recreation. Clark et al. (1971) surveyed visitors and managers of selected developed campgrounds in Washington State. Visitors generally reported high ratings on a number of the more traditional camping values such as experiencing solitude and tranquility and appreciating unspoiled beauty. Managers substantially underestimated the importance of such values to campers, apparently unable to rationalize these values with use of developed campgrounds. The apparent incongruity of visitor

values is evident in response patterns to two motivation items in particular. Nearly two-thirds of the visitors rated solitude and tranquility as very important, while only about one-quarter rated getting away from people other than my camping party as very important. In a similar study of Minnesota state parks, Merriam, Wald, and Ramsey (1972) found that users defined these areas primarily in terms of recreation, while managers defined them in terms of natural areas designed for preservation. A third study of this issue focused on an urban landscape resource: The University of Washington Arboretum (Twight and Catton 1975). Visitors were found to be more oriented to preservation and naturalness of the area than managers and less oriented to scientific, educational, and horticultural aspects. In all three studies, visitors define the study areas primarily in terms of what they use them for rather than the purposes for which the areas may have originally been established.

Two more recent studies have added additional insight to this issue. Wellman et al. (1982) explored how well managers were able to predict the motivations of visitors to two national park areas: Cape Hatteras National Seashore (a recreation area with substantial off-road vehicle use), and Shenandoah National Park backcountry (a natural area). Statistically significant differences were found between visitor and manager ratings on sixteen of 22 motivation items at Cape Hatteras and eight of 25 motivation items at Shenandoah. The authors suggest that the greater convergence of visitor and manager perceptions at Shenandoah might be explained by the fact that this area is more traditional in environment and use within the national park system than Cape Hatteras. Tentative support for this hypothesis is offered by a similar study of ski-touring on national forest lands in Colorado (Rosenthal and Driver 1983).

Very close agreement was found in this study between visitor motivations and manager predictions. This study area was also primarily undeveloped backcountry more conventionally associated with outdoor recreation.

Four studies have included components which examine the different perceptions of visitors and managers of recreation impacts and problems. The findings have been highly consistent: managers are much more perceptive of such issues than visitors in all areas studied including developed campgrounds (Clark et al. 1971), wilderness (Peterson 1974), roaded forest lands (Downing and Clark 1979), and non-motorized recreation areas (Lucas 1979). Impacts and problems studied included litter, vandalism and theft, human waste, environmental impacts at campsites and along trails, water pollution, wildlife disturbance, excessive noise, rule violations, and conflicts between recreationists.

The third broad aspect of recreation investigated by this group of studies are attitudes and preferences for area management. The first of these studies focused on visitors and managers of three western wilderness areas (Hendee and Harris 1970). Visitors were asked to rate the extent to which they agreed with an extensive list of wilderness attitude statements, policy and management alternatives, and appropriate behavior items. Wilderness managers were asked to predict visitor responses. Broad agreement was found on two-thirds of the items, but disagreement on the remaining items illustrated several important misconceptions of managers. Managers overestimated visitor support for facility development and the prevalence of "purist" attitudes (e.g., many visitors did not object to use of helicopters for management purposes though managers thought they would). Managers also anticipated strong opinions

from visitors who were actually neutral or had no opinion on management issues. Lastly, managers underestimated the responsiveness of visitors to measures of behavioral control (e.g., camp clean up requirements and restrictions on trail shortcutting).

Nearly all the above studies have speculated on why differences in perception exist between managers and visitors. A popular theory suggests that managers are more oriented to the natural environment and traditional conceptions of outdoor recreation by virtue of their professional training in the natural sciences, especially biology, their rural residence, the professional missions under which they operate, and their experience with the natural environment, both generally and specifically on study sites. Another theory suggests a process of selective perception reinforcing the managers' attitudinal and perceptual predispositions. Inaccurate assessments of visitors may also result from the fact that managers most often come into contact with vocal and opinionated visitors who may not be representative of most visitors with more moderate or less-developed views. And, finally, managers' own attitudes may affect their perceptions of recreation visitors: a manager's opinion of what visitors should prefer may well influence his or her view of what visitors do prefer (Heberlein 1973). But regardless of the reason why, it is evident that managers and visitors of outdoor recreation and other resource management areas often hold different perceptions. Neither can be considered "correct." But, visitors are an important part of the outdoor environment, and managers should seek out objective measures of visitor attitudes, preferences, and perceptions. Similarly, whether users of the resource in question are local residents, rather than visitors to a remote location their opinions are equally critical and should be polled rather than simply assumed.

Sustainable resource management and, therefore, sustainable regional development of the Greater Charleston Harbor Area necessitates an assessment of environmental, economic, and human resource inputs at the local level. Decisions about these resources have important impacts for residents. It is therefore vital to assess resident attitudes concerning issues that may have an impact on their quality of life as well as an impact on the sustainability of natural resources within the Greater Charleston Harbor Area. This study proposes to address these issues.

### **Problem Statement and Purpose**

The assessment of the perceptions and attitudes of residents of the tri-county area (Berkeley, Charleston, and Dorchester) is necessary for the management of the Greater Charleston Harbor area for environmental and social purposes. The purpose of this study was to assess and report the perceptions and attitudes of residents of the tri-county area toward environmental resource and growth issues that have arisen during the environmental assessment phase of the Charleston Harbor Project. Thus, the necessary social component will be added to the environmental assessments already completed, facilitating sustainable development.

### **Objectives**

The following objectives were pursued to address the stated study purpose:

1. To determine perceptions of various natural, environmental, and social resource issues of the Greater Charleston Harbor area among tri-county residents.
2. To determine the importance placed on various scenic, cultural, and natural resources of this area.

3. To assess the degree to which residents have noticed change in resource conditions over time, and their feelings toward the need for development of a regional management plan.
4. To determine any inconsistencies in attitude between subgroups of the population by comparing sociodemographic categories with respect to specific variables.

## **METHODS**

### **Study Area**

The tri-county area of Berkeley, Charleston, and Dorchester counties in South Carolina comprised the study area. Within the tri-county area, selection of residents was further restricted to individuals living within a 20-mile radius of Charleston. Since this study is associated with the Charleston Harbor Project and local issues, a very local population was selected for inclusion.

### **Instrument Development**

The telephone survey questionnaire was developed by personnel of Clemson University's Department of Parks, Recreation and Tourism Management and the S.C. Department of Natural Resources, Marine Resources Division. Input for survey questions and review of the survey instrument were provided by personnel of the Charleston Harbor Project, Ocean and Coastal Resources Management Office, S.C. Department of Health and Environmental Control.

The survey instrument consisted of 16 natural resource and environmental management issues, six (6) scenic/cultural/natural area resource items, and 10 socioeconomic/ background questions (see Appendix A).

## **Study Sample and Telephone Survey**

A random-digit telephone survey was conducted of 350 tri-county residents (18+ years of age) during July 1997. The number of surveys completed in each county was: Berkeley (100), Charleston (139), and Dorchester (111). The survey was conducted during evening hours and Saturdays by Clemson University by the Sociology Department's Computer Assisted Telephone Interviewing (CATI) Laboratory. A total of four re-dials were made on unanswered phone numbers before they were dropped from the sample. There were 743 individuals contacted, with 393 refusing to participate in the voluntary study. This resulted in a 47% response rate of those contacted.

When respondents answered the phone, they were asked to voluntarily participate. If they volunteered, their county of residence was obtained. They were then asked to indicate how much they disagreed or agreed with the 16 management issues, using a 5-point rating scale ranging from strongly agree to strongly disagree. Next, respondents were asked how important to them were the six scenic/cultural/natural area resources. A 5-point importance scale was provided for their reply, ranging from very important to very unimportant.

Background information was obtained on how long residents had lived in the tri-county area and their waterfront/boat dock ownership patterns. Related to these lengths of residence and property ownership questions was an item to detect if residents had noticed any change in the abundance of edible fish/shellfish over time. Additionally, respondents were asked to indicate their gender, age, education, income level, employment status, and household size. The survey ended with an opportunity for respondents to make open comments that would help with

the study. For the exact wording of items, the rating scales, and comments, see the instrument in Appendix A and comments in Appendix B of this report. The comments have received little editing in order that readers may form their own opinion about the meaning of the comments and therefore, prevent any researcher bias in the interpretation.

## **Data Analysis**

Initial data analysis consisted of computing frequencies (number and percent of responses) and descriptive statistics (arithmetic means and standard deviations) of the survey variables. Relevant results were tabulated for discussion purposes. Further data analysis consisted of inferential statistical tests (including t-tests, analyses of variance [ANOVA], and chi-square tests) to determine whether or not sociodemographic subgroups of the population differed significantly in their attitudes toward the issues under discussion.

## **RESULTS AND DISCUSSION**

The results and interpretation of the findings are presented in three sections. First, a profile of respondents, including both sociodemographic characteristics and residence and property ownership characteristics is provided. Next, respondent opinions regarding the 16 management issues and the 6 scenic/cultural/natural area resources are discussed. Finally, comparisons of subgroups within the sample to determine differences between sociodemographic groups are reported.

### **Sociodemographic Characteristics of the Sample**

Sociodemographic characteristics of the respondents are presented in Table 1. These characteristics include gender, age, education, employment status, income, and number of people in household. Totals of less than 350 indicate a refusal to answer individual items by some residents.

Gender. The majority of respondents were females (54.9%), while males consisted of 45.1% of the sample.

Age. Age was measured in three (3) category levels. The age range of 36-55 years had the most respondents (47%). About equal portions of respondents were young adults (26.9% in the 18-35 year range) and senior citizens (26.3% over 55 years).

Education. Respondents were fairly well educated, with nearly 60% (58.3) of them having some college training or a college degree. Approximately a third of them were college

graduates, with another 11.8% having additional post-college/professional education. Only 4.9% had less than a high school education, and a fourth were high school graduates.

Employment Status. Nearly 60% of tri-county respondents were currently employed. The second most represented groups were retirees (21.8%). Eight percent (8%) of respondents were full-time homemakers and another 3.7% were classified as students.

Income. Incomes reported represent the total annual household income, including all members. Most of the incomes fell into the middle-income range of \$20,000 to \$60,000 (62.4%), with one-third (33.7%) having incomes of \$40,000 to \$60,000. Higher income households were represented by approximately 28% of respondents (greater than \$60,000), while lower income households (less than \$20,000) comprised 9.3% of the sample.

Number of People in Household. The mean (average) number of people per household was nearly 3 ( $\bar{x} = 2.79$ ). A third (34.2%) of households had two members, while about a fifth (23.3%) of them had three and another fifth (19.8%) had four members. Single member households represented 14.1% and households with five or more persons comprised about 9% of the sample.

**Table 1. Sociodemographic characteristics of respondents.**

<b>Sociodemographic Characteristics</b>	<b>Number of Respondents (N)</b>	<b>Percent of Respondents (%)</b>
Gender		
Female	192	54.9
Male	158	45.1
Age		
18-35 years	93	26.9
36-55	162	46.8
over 55	91	26.3
Education		
< High school	17	4.9
High school graduate	87	25.0
Some college	87	25.0
College graduate	116	33.3
Post grad/professional	41	11.8
Employment Status		
Employed	208	59.6
Retired	76	21.8
Full time homemaker	28	8.0
Student	13	3.7
Other	24	6.9
Income (annual for total household)		
< 20,000	28	9.3
20,000 - 39,999	86	28.7
40,000 - 59,999	101	33.7
60,000 - 79,999	50	16.7
80,000 - 99,999	20	6.7
> 100,000	15	5.0
Number of People in Household ( $\bar{x} = 2.79$ ) <sup>1</sup>		
1	49	14.1
2	119	34.2
3	81	23.3
4	69	19.8
5	18	5.2
6	9	2.6
7	3	0.9

<sup>1</sup>  $\bar{x}$  represents the mean value or average value

## **Residence and Property Ownership Characteristics**

Residence and property ownership findings of tri-county respondents are summarized in Table 2. These characteristics include: length of residence, county of residence, waterfront property ownership, and whether a boat dock exists on the waterfront property.

Length of Residence in Tri-County Area. Residents had lived in the Berkeley, Charleston, Dorchester tri-county area an average of 21.45 years. Nearly one-half (45.7%) of residents had lived in the tri-county area for over 20 years. Another quarter (25.3%) of them had lived in the area between 11 and 20 years. Only 17.9% had lived in the area for 5 years or less. Thus, the information being provided in this sample is coming mainly from longer term residents of the study area. Length of residence in the tri-county area ~~Acould@~~be an important factor influencing respondents' perception of natural resource management, importance of issues, and notice of change in conditions over longer time periods.

County of Residence. The sample, by design, consisted of approximately equal percentages of tri-county respondents. Nearly 40% of residents were from Charleston County, while about 30% were from each of Dorchester (31.7%) and Berkeley (28.6%) Counties.

Waterfront Property and Boat Dock Ownership. A very small percentage (6.6%) of respondents actually owned waterfront property. Although this is a small proportion of the sample, information from them is considered especially important and this variable was used to compare waterfront property owners to non-waterfront property owners.

Less than one-half of those respondents who owned waterfront property (and only 9 of the total 350 respondents) owned a boat dock on their property. While this may have some

limited value in determining the proportionality of boat dock ownership in this area, the number of respondents in this category was too small to be used as the basis for any inferential statistical testing.

**Table 2. Residential information of survey respondents.**

<b>Residence/Property Variable</b>	<b>Number of Respondents (N)</b>	<b>Percent of Respondents (%)</b>
Length of Residence in Tri-county Area ( $\bar{x}$ = 21.45 years)		
1-5 years	61	17.9
6-10	38	11.1
11-15	43	12.6
16-20	43	12.7
21-30	65	19.0
31-40	51	15.0
41-50	33	9.6
> 50 years	7	2.1
County of Residence		
Charleston	139	39.7
Dorchester	111	31.7
Berkeley	100	28.6
Waterfront Property Ownership		
Yes (have water front)	23	6.6
No (do not have)	326	93.4
Boat Dock Ownership on Property		
Yes		
No	9	2.6
No waterfront property, therefore no boat dock	14	4.0
	326	93.4

## **Perceptions of Respondents Toward the Management of Natural Resources of the Greater Charleston Harbor Area**

Respondents were asked to indicate how much they agreed with the 16 resource management issues. The original wording of the 16 items, the percentage of respondents indicating each of the five levels in the agreement scale, and the mean (average, indicate by  $\bar{x}$ ) agreement rating for each statement, are presented in Table 3.

A total of 94.9% of the respondents either agreed or strongly agreed that **It is important to me to have locally caught fish and shellfish that are safe for human consumption** ( $\bar{x} = 4.48$ , 56% strongly agreed). In fact, only 2.6% disagreed/strongly disagreed and 2.6% were neutral on this issue. Most residents (95.7%) also agreed/strongly agreed that **historical and archeological sites in the Greater Charleston area are important to the community and should be protected**. The third and fourth most agreed upon statements (also with 95% or more agreeing or strongly agreeing), respectively, were: **Growth (new roads, businesses, homes, water, and sewer lines, etc.) should be supported only if it is done in a reasonable and ecologically acceptable manner** ( $\bar{x} = 4.23$ ) and **A regional management plan for the tri-county area should be developed to protect our environmental resources while allowing needed growth and development** ( $\bar{x} = 4.18$ ). Thus, the vast majority of respondents feel that local edible fisheries and historical/archeological resources are important to the local area, and should be protected through a regional management plan for ecologically acceptable growth and development.

This latter statement is further validated by the two least agreed upon resource issues. These were AThe benefits of development and growth within the tri-county area and Charleston outweigh the negative consequences to wetlands, water quality, and fisheries@ ( $\bar{x} = 2.59$ , 55.9% disagree/strongly disagree and only 23.5% agree/strongly agree) and AI believe that as growth and development of this area continues, the water in the Charleston Harbor and surrounding rivers and creeks will be safe enough to produce a healthy fishery even 20 years in the future@ ( $\bar{x} = 2.74$ , 61.8% disagree/strongly disagree and only 27.5% agree/strongly agree). However, nearly one-fourth of the respondents were neutral on both of these statements, perhaps indicating that they need more information before making a decision.

The water quality in the Charleston Harbor and surrounding rivers/creeks was of concern to respondents. Only about one percent (1.1%) strongly agreed, and another quarter (26.9%) agreed, that these waters were clean and safe for swimming. Many respondents were neutral (29.8%) on the statement, or disagreed with it (36.1%).

Further examination of the data in Table 3 indicates that there was consistent concern for all of the resource management issues. It is important to note that questions with low means that indicate a Adisagree@ to Astrongly disagree@ answer do not necessarily indicate lack of concern for the issue, but are reflective of the manner in which the question was asked.

While tri-county residents were pro-resource management, they were not necessarily anti-growth/development. For example, the majority of respondents (about two-thirds) agreed that A tourism in the tri-county area has improved the economy of the Greater Charleston area@ and A they support tourism and would like to see it continue as a major industry in the area.@

The tri-county residents seem to be asking for protection of their natural and environmental resources through sustainable and ecologically based regional growth and development, rather than promoting an anti-growth and development orientation toward protecting local natural resources.

**Table 3. Percent of respondents and mean scores for 16 management issues (n=350).**

Management Issue	% of Respondents					Mean <sup>1</sup> Value
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1. I frequently visit scenic areas within the Greater Charleston area (e.g., beaches, county parks, Cypress Gardens)	2.3	18.3	7.7	53.4	18.3	3.67
2. I frequently visit cultural attractions within the Greater Charleston area (e.g., the Battery Market, Ft. Sumter, Middleton Place)	2.9	26.9	12.6	45.7	12.0	3.37
3. The water in the Charleston Harbor and surrounding rivers and creeks is clean and safe for swimming	6.0	36.1	29.8	26.9	1.1	2.81
4. It is important to me to have locally caught fish and shellfish that are safe for human consumption.	0.6	2.0	2.6	38.9	56.0	4.48
5. I believe the water in the Charleston Harbor and surrounding rivers and creeks will be safe enough to produce a healthy fishery 20 years in the future.	10.7	35.1	26.7	24.9	2.6	2.74
6. Tidal creeks and adjacent wetlands in the tri-county area are being threatened by urbanization.	0.9	9.2	10.1	57.2	22.5	3.91

Continued . . . /

**Table 3/cont. Percent of respondents and mean scores for 16 management issues (n=350).**

Management Issue	% of Respondents					Mean <sup>1</sup> Value
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
7. Development restrictions adjacent to tidal creeks and wetlands are necessary to protect local fisheries	0.6	5.2	8.7	62.4	23.1	4.02
8. I would support community boat docks in order to lessen the environmental impact of private individual docks.	1.4	13.2	18.6	53.3	13.5	3.64
9. Some shoreline nesting birds (e.g., brown pelicans, terns, sandpipers) are disturbed during their nesting periods. I would support protection of these habitats even if it means I might not be able to access certain areas during that time.	0.3	5.7	6.0	62.3	25.7	4.07
10. It is important to me that small isolated wetlands be protected even if these are located on my property.	1.4	8.3	11.7	61.4	17.1	3.85
11. The historical and archeological sites in the Greater Charleston area are important to the community and should be protected.	0.3	1.4	2.6	63.6	32.1	4.26
12. Tourism in the tri-county area has improved the economy of the greater Charleston area.	0.0	2.3	9.2	64.8	23.8	4.10
13. I support tourism and would like to see it continue as a major industry in our area.	1.1	3.2	9.2	66.8	19.8	4.01

Continued . . . /

**Table 3/cont. Percent of respondents and mean scores for 16 management issues (n=350).**

Management Issue	% of Respondents					Mean <sup>1</sup> Value
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
14. The benefits of development and growth within the tri-county area and Charleston outweigh the negative consequences to wetlands, water quality and fisheries.	9.5	46.4	20.6	22.6	0.9	2.59
15. Growth (new roads, businesses, homes, water and sewer lines, etc.) should be supported only if it is done in a reasonable and ecologically accepted manner.	0.0	1.1	1.4	70.5	26.9	4.23
16. A regional management plan for the tri-county area should be developed to protect our environmental resources while allowing needed growth and development.	0.0	1.4	3.2	71.3	24.1	4.18

<sup>1</sup> Means based on a 5-point scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

### **Importance of Scenic, Cultural, and Natural Area Resources**

Respondents were asked to indicate how important certain scenic, cultural, and more passive-use resources were to the tri-county area. The importance ratings of respondents for these items are summarized in Table 4.

As the data in Table 4 indicates, scenic vistas and related natural areas were all either important or very important to the vast majority of the respondents. In fact, there was little variation in how important scenic vistas, whether of the Charleston Harbor, marshes and

wetlands, forests or local byway/historical trails, were to respondents (means ranged from 4.21 to 4.27 for these four scenic resources). Greenbelts were rated marginally lower (4.13) than the above scenic resources but, overall, the items rated high in importance to residents.

Scenic vistas and visual resources in natural areas, while important in and of themselves, commonly serve multiple resource uses and management purposes. Therefore, scenic vistas and natural areas are more than passive-use resources; they are very important to the public and must be managed or preserved in the same manner as any other environmental resource.

Tri-county residents were asked to indicate the importance of a regional management plan oriented toward the management of natural vegetation buffer zones and associated resources.<sup>1</sup> This particular item received the highest importance rating (mean = 4.44, 56.6% rating very important). Thus, it seems tri-county residents are supportive of a regional management plan oriented toward the protection of natural and scenic resource areas. This question served as validation for the previous, broader question on which residents strongly agreed that a regional management plan for the tri-county area should be developed to protect environmental resources while allowing needed growth and development. Answers to both questions were consistently positive and therefore, imply that residents are not ambiguous about their desire for a regional management plan. It also seems that they particularly favor a management plan that would create buffer zones to protect water quality and fish habitats.

However, it is important to note that respondents frequently asked that this question be

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<sup>1</sup> Actual wording of item was: A Natural vegetation buffer zones are 50 foot grassy areas that maintain water quality and protect fishery habitat and natural areas. How important do you feel it is to develop a regional management plan that would create natural vegetation buffer zones?@

repeated, indicating that buffer zones may have been a new concept to them. It is assumed that repetition and explanation of the question clarified the issue enough so that residents indeed felt that this was something they wanted. Whether or not they completely understood the concept of a buffer zone, it seems that they were supportive of a management plan that would protect water quality and fish habitats. It is especially worth noting that with respect to each of the six items under consideration, approximately 90% considered the issues to be somewhat or very important.

**Table 4. Importance of scenic, cultural, and natural area resources to the residents of Berkeley, Charleston, and Dorchester counties.**

Resource Issue	% of Respondents					Mean <sup>1</sup> Value
	Very Unimportant	Somewhat Unimportant	Neutral	Somewhat Important	Very Important	
Scenic vistas of Charleston Harbor	0.0	3.2	8.6	47.0	41.3	4.26
Scenic vistas of marshes and wetlands	0.0	2.6	10.0	45.0	42.4	4.27
Scenic vistas of forested areas	0.0	3.2	8.3	50.7	37.8	4.23
Greenbelts along rivers and streams	0.0	3.4	11.2	54.4	30.9	4.13
Scenic byways and historical trails	0.0	2.6	9.2	52.4	35.8	4.21
Natural vegetation buffer zones <sup>2</sup>	0.3	2.9	6.3	33.9	56.6	4.44

<sup>1</sup> Means based on a 5-point importance scale, where 1 = very unimportant, 2 = somewhat unimportant, 3 = neutral, 4 = somewhat important, 5 = very important.

<sup>2</sup> The actual statement was: "Natural vegetation buffer zones are 50 foot grassy areas that maintain water quality and protect fishery habitat and natural areas. How important do you feel it is to develop a regional management plan that would create natural vegetation buffer zones?"

## **Comparison of Subgroups of the Survey Sample**

Although average responses to various resource management issues were reported previously, there is of course no such thing as an ~~A~~average respondent. In reality, there are commonly various segments of respondents that may or may not vary in their response to certain items. This section addresses the following basic question: Do different subsegments of the tri-county sample differ significantly (statistically) in their perception and importance ratings of natural and environmental resource management issues.

### **Comparison with Respect to the 16 Management Items**

Six variables were examined to see if they affected the way subsegments of respondents perceived the 16 management issues previously described. The six variables selected for examination were those thought most likely to lead to differences in how residents might respond to the issues, specifically: education level, age, waterfront property ownership, county of residence, income level, and gender. Analyses of variance (ANOVA) and t-tests were used to examine for significant differences in how these factors affected the mean perception ratings of respondents.

Education. Education level of respondents was the most influential factor, leading to 8 of the 16 management issues being rated significantly differently (Table 5). A general pattern emerges from the data to indicate that the more educated respondents, particularly college graduates and post-graduates, rated the management issues more highly. They more frequently visit scenic and cultural resources, support historical/archeological sites and local tourism, and

support ecologically acceptable growth and development through a regional management plan. Less educated respondents were significantly higher on only one issue, agreeing more that the benefits of growth and development have outweighed the negative consequences to wetlands, water quality, and fisheries.

**Table 5. Comparison of agreement ratings with respect to the 16 management items and ANOVA results, by educational level.**

Management Issue	Mean Agreement Rating <sup>1</sup>				F - Ratio	Probability Level
	≤ High School	Some College	College	Post-Grad		
1. I frequently visit scenic areas within the Greater Charleston area (e.g., beaches, county parks, Cypress Gardens)	3.01 <sup>a</sup>	3.51 <sup>a</sup>	4.04 <sup>b</sup>	3.88 <sup>ab 2</sup>	11.21	0.0001* <sup>3</sup>
2. I frequently visit cultural attractions within the Greater Charleston area (e.g., the Battery market, Ft. Sumter, Middleton Place)	3.01 <sup>a</sup>	3.25 <sup>a</sup>	3.64 <sup>b</sup>	3.81 <sup>b</sup>	9.27	0.0001*
3. The water in the Charleston Harbor and surrounding rivers and creeks is clean and safe for swimming	2.81	2.64	2.90	2.90	1.38	0.2500
4. It is important to me to have locally caught fish and shellfish that are safe for human consumption.	4.21 <sup>a</sup>	4.60 <sup>b</sup>	4.63 <sup>b</sup>	4.44 <sup>ab</sup>	8.16	0.0001*
5. I believe the water in the Charleston Harbor and surrounding rivers and creeks will be safe enough to produce a healthy fishery 20 years in the future.	2.80	2.55	2.81	2.76	1.20	0.3097
6. Tidal creeks and adjacent wetlands in the tri-county area are being threatened by urbanization.	3.85	3.92	3.97	3.93	0.35	0.7921

Continued . . . /

**Table 5/cont. Comparison of agreement ratings with respect to the 16 management items and ANOVA results, by educational level.**

Management Issue	Mean Agreement Rating <sup>1</sup>					Probability Level
	≤ High School	Some College	College	Post-Grad	F - Ratio	
7. Development restrictions adjacent to tidal creeks and wetlands are necessary to protect local fisheries	3.89	4.09	4.04	4.15	1.63	0.1812
8. I would support community boat docks in order to lessen the environmental impact of private individual docks.	3.55	3.63	3.69	3.76	0.67	0.5704
9. Some shoreline nesting birds (e.g., brown pelicans, terns, sandpipers) are disturbed during their nesting periods. I would support protection of these habitats even if it means I might not be able to access certain areas during that time.	3.97	4.16	4.12	4.05	1.20	0.3114
10. It is important to me that small isolated wetlands be protected even if these are located on my property.	3.75	3.97	3.85	3.85	1.01	0.3896
11. The historical and archeological sites in the Greater Charleston area are important to the community and should be protected.	4.12 <sup>a</sup>	4.32 <sup>b</sup>	4.30 <sup>b</sup>	4.34 <sup>ab</sup>	2.77	0.0417*
12. Tourism in the tri-county area has improved the economy of the greater Charleston area.	3.96 <sup>a</sup>	4.12 <sup>ab</sup>	4.15 <sup>b</sup>	4.29 <sup>b</sup>	3.11	0.0266*
13. I support tourism and would like to see it continue as a major industry in our area.	3.94	4.06	4.01	4.07	0.53	0.6606
14. The benefits of development and growth within the tri-county area and Charleston outweigh the negative consequences to wetlands, water quality and fisheries.	2.80 <sup>0</sup>	2.61 <sup>ab</sup>	2.39 <sup>b</sup>	2.59 <sup>ab</sup>	3.35	0.0191*
Continued . . . /						

**Table 5/cont. Comparison of agreement ratings with respect to the 16 management items and ANOVA results, by educational level.**

Management Issue	Mean Agreement Rating <sup>1</sup>					Probability Level
	≤ High School	Some College	College	Post-Grad	F - Ratio	
15. Growth (new roads, businesses, homes, water and sewer lines, etc.) should be supported only if it is done in a reasonable and ecologically accepted manner.	4.11 <sup>a</sup>	4.37 <sup>b</sup>	4.27 <sup>b</sup>	4.17 <sup>ab</sup>	4.41	0.0046*
16. A regional management plan for the tri-county area should be developed to protect our environmental resources while allowing needed growth and development.	4.03 <sup>a</sup>	4.33 <sup>b</sup>	4.20 <sup>b</sup>	4.20 <sup>ab</sup>	5.17	0.0017*

<sup>1</sup> Means based on a 5-point agreement scale where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

<sup>2</sup> Means with different superscripts are significantly different from each other, Duncan's Multiple Range Test, p # 0.05.

<sup>3</sup> Probabilities with an \* indicate a significant difference.

Age. Four (4) of the 16 items were affected by the age level of respondents. Since this represents only 25% of the issues, only the significant items (p # 0.05) and related data are presented in Table 6. The mean differences in Table 6 show that the respondents over 55 years of age (senior citizens) supported these four issues less than the 18-35 and 36-55 year age groups. Two of the items involved frequency of visitation to scenic and cultural attractions. It seems logical that older people might be less active and therefore visit these resources less. They also supported the development of a regional management plan less. However, their mean

rating of 4.02 still indicates that they agree that a plan should be developed to protect environmental resources.

**Table 6. Comparison of agreement ratings with respect to the 16 management items and ANOVA results, by age range.**

Management Issue	Mean Agreement Rating <sup>1</sup>			F - Ratio	Probability Level
	18-35 yrs.	36-55 yrs.	Over 55 yrs.		
1. I frequently visit scenic areas within the Greater Charleston area (e.g., beaches, county parks, Cypress Gardens)	3.93 <sup>a</sup>	3.74 <sup>a</sup>	3.32 <sup>b 2</sup>	8.55	0.0002* <sup>3</sup>
2. I frequently visit cultural attractions within the Greater Charleston area (e.g., the Battery market, Ft. Sumter, Middleton Place)	3.37 <sup>a</sup>	3.51 <sup>ab</sup>	3.13 <sup>a</sup>	3.60	0.0284*
11. The historical and archeological sites in the Greater Charleston area are important to the community and should be protected.	4.39 <sup>a</sup>	4.27 <sup>a</sup>	4.11 <sup>b</sup>	4.98	0.0074*
16. A regional management plan for the tri-county area should be developed to protect our environmental resources while allowing needed growth and development.	4.20 <sup>a</sup>	4.27 <sup>a</sup>	4.02 <sup>b</sup>	6.09	0.0025*

<sup>1</sup> Means based on a 5-point agreement scale where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

<sup>2</sup> Means with different superscripts are significantly different from each other, Duncan's Multiple Range Test, p # 0.05.

<sup>3</sup> Only items significant at a probability level of at least 0.05 were listed of the 16 examined.

Waterfront Property Ownership. Whether one owned waterfront property or not affected how residents rated 3 of the 16 issues (Table 7). Again, statistics are presented only for the significantly different issues. In two of the three cases, waterfront property owners

supported tourism more than non-waterfront owners, and waterfront property owners also felt that the availability of locally caught fish/shellfish was more important than others. However, one must keep in mind two facts when interpreting the practical significance of these findings. First, waterfront property ownership made no significant difference on the perception of the other 13 management issues. And perhaps even more important, while there is a statistically significant difference on three items, the difference lies only in the strength of opinion, not in a difference of opinion. Waterfront property owners simply feel a little stronger about how important tourism is to the area and the importance of having locally caught seafood that is safe for consumption.

**Table 7. Comparison of agreement ratings with respect to the 16 management items and ANOVA results, by waterfront property ownership.**

Management Issue	Mean Agreement Rating <sup>1</sup>		t -Value	Probability Level
	Own Waterfront	No Waterfront Property		
4. It is important to me to have locally caught fish and shellfish that are safe for human consumption.	4.74	4.46	2.78	0.009* <sup>2</sup>
12. Tourism in the tri-county area has improved the economy of the greater Charleston area.	4.39	4.08	2.26	0.024*
13. I support tourism and would like to see it continue as a major industry in our area.	4.30	3.99	2.04	0.042*
<sup>1</sup> Means based on a 5-point agreement scale where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.				
<sup>2</sup> Only items significant at a probability level of at least 0.05 were listed.				

County of Residence, Income Level, and Gender. These three variables had essentially no effect on how respondents perceived the management issues. Only 1 of the 16 items was rated differently based on each of the county of residence and income level variables. None of the items were rated differently by males and females. Since one might expect 1 in 20 (or 5%) of the item comparisons to be significantly different simply by chance at a 0.05 (or 5%) probability-level, it would be unreasonable to draw any major conclusions for the minimal differences that were found with regard to these three variables.

### **Comparisons with Respect to the Six Scenic/cultural/natural Area Resources**

The same six sociodemographic variables used to test for significant differences on the 16 management issues were used to ascertain potential differences in how important respondents rated scenic and cultural resources. The following discussion must be considered with one caveat. Some statistical differences among various segments of the residents were indeed found. However, as before, these differences did not in any case represent opposing views of the residents. Instead, they represent differences only in the strength of opinion that the residents had about each of the issues, with general agreement prevailing.

Education. Education level was responsible for four of the six or two-thirds of the scenic and cultural issues being rated significantly different (Table 8). In most cases, respondents with a high school education rated the items lower in importance than those with post high school training. However, there was little individual difference among those with some college, college or post-graduate training. As previously, note that the differences are only in

strength of opinion and that residents with differing educational levels did not hold opposing views.

Waterfront Property Ownership. Three of six or 50% of the items were affected by waterfront property ownership (Table 9). As might be expected, owners of waterfront property felt that scenic vistas of the Charleston Harbor and of forested areas, and protection of natural vegetation zones were more important than non-owners. Again, it must be stressed that the difference was only in the strength of opinion and did not indicate opposing views.

County of Residence, Age, Income Level and Gender. These four variables had little to no effect on how important different respondents rated the six resource items. County of residence was responsible for one item being rated significantly different, while age, income, and gender had no effect on any of the items. In the case of county residence, Charleston County residents felt that scenic vistas of Charleston Harbor were a more important resource ( $\bar{x} = 4.42$ ) than did residents of Berkeley ( $\bar{x} = 4.07$ ) and Dorchester ( $\bar{x} = 4.25$ ) counties ( $f = 6.55$ ,  $df = 2,346$ ,  $p = 0.0016$ ).

**Table 8. Comparison of agreement ratings with respect to the 6 scenic/cultural/natural resource area items and ANOVA results, by educational level.**

Resource Issue	Degree of Importance (%) <sup>1</sup>				F-Ratio	Probability Level
	≤ High School	Some College	College	Post-Grad		
Scenic vistas of Charleston Harbor	4.09 <sup>a 1</sup>	4.38 <sup>b</sup>	4.33 <sup>b</sup>	4.29 <sup>ab</sup>	3.00	0.0308* <sup>2</sup>
Scenic vistas of marshes and wetlands	4.01 <sup>a</sup>	4.32 <sup>b</sup>	4.42 <sup>b</sup>	4.42 <sup>b</sup>	6.82	0.0002*
Scenic vistas of forested areas	4.10	4.34	4.23	4.34	2.21	0.0868
Greenbelts along rivers and streams	4.03	4.25	4.12	4.15	1.47	0.2218
Scenic byways and historical trails	4.01 <sup>a</sup>	4.38 <sup>b</sup>	4.29 <sup>b</sup>	4.17 <sup>ab</sup>	5.10	0.0018*
Natural area vegetation zones	4.29 <sup>a</sup>	4.62 <sup>b</sup>	4.43 <sup>a</sup>	4.44 <sup>a</sup>	2.99	0.0313*

<sup>1</sup> Means with different superscripts are significantly different from each other, Duncan's Multiple Range Test, p# 0.05

<sup>2</sup> Probabilities with an \* indicate a significant difference.

**Table 9. Comparison of agreement ratings with respect to the 6 scenic/cultural/natural resource area items and ANOVA results, by waterfront property ownership.**

Resource Issue	Mean Importance Rating <sup>1</sup>		t-Value	Probability Level
	Own Waterfront Property	No Waterfront Property		
Scenic vistas of Charleston Harbor	4.57	4.24	2.01	0.045* <sup>2</sup>
Scenic vistas of marshes and wetlands	4.52	4.26	1.67	0.097
Scenic vistas of forested areas	4.61	4.21	2.58	0.010*
Greenbelts along rivers and streams	4.17	4.13	0.30	0.763
Scenic byways and historical trails	4.39	4.20	1.23	0.220
Natural area vegetation zones <sup>3</sup>	4.70	4.42	2.59	0.015*

<sup>1</sup> Means based on a 5-point importance scale, where 1 = very unimportant, 2 = somewhat unimportant, 3 = neutral, 4 = somewhat important, 5 = very important

<sup>2</sup> Probabilities with an \* indicate a significant difference.

### Comparisons with Respect to Perceptions of Change in the Fishery Resource

It is important for natural resource and environmental management agencies to obtain input from their constituencies about the present state of resource conditions. It is also important to know if residents have noticed any change in conditions over time. For example, have residents perceived an increase, decrease or no change in environmental conditions over longer time periods.

It was of particular interest for this study to determine if residents of the tri-county area perceived any change in the abundance of edible fish and shellfish during their residency in this

area. They were asked to indicate if they had noticed an increase, decrease, or no change in this resource during the time they had lived in the tri-county area. About an equal number of respondents felt that the edible fish/shellfish resource had decreased (39.7%) or stayed the same (32.0%) during their residence in the area (Table 10). Only 5.7% felt the fishery resource had increased. This question was problematic for a number of residents. Many residents (22.6%) felt that they simply did not know whether there had been a change in abundance of edible fish.

Whether one has noticed, a change in the abundance of fish/shellfish over time might be expected to vary with how long they have lived in the tri-county area. Table 11 shows that there is a significant difference between length of residence in the tri-county region and whether residents noticed an increase/decrease, or no change in the resource. Residents that felt the fishery resource had stayed the same had lived in the region for about 20 years, while those who felt it had decreased or increased had lived in the region longer (25 and 30 years, respectively). It is difficult to interpret these results in a meaningful manner. Clearly, both groups of longer term residents differ greatly in their perceptions of the change in the fishery resource. Without additional quantitative knowledge and basis for comparison regarding the nature of the fishery resource 25-30 years ago, it is impossible to meaningfully interpret these results. The most that can be inferred is that perceptions differ in this regard and that length of residency is not a determining factor in regard to these perceptions. However, as mentioned above, the percentage of those who feel that the fishery resource has increased (5.7%) represents a very small minority while approximately 40% perceive that there has been a decrease.

While one might speculate that other factors are capable of affecting how respondents would notice change in the edible fish/shellfish resource, none were found. County of residence, waterfront property ownership, age, education, income, and gender lead to no differences in how respondents rated change in the fishery resource.

**Table 10. Frequency of response with regard to perception of change in the fishery resource.<sup>1</sup>**

<b>Perception of Change</b>	<b>Number of Respondents (N)</b>	<b>Percent of Respondents (%)</b>
Increased	20	5.7
Decreased	139	39.7
Stayed same	112	32.0
No response	79	22.6

<sup>1</sup> Actual wording of the item was: Have you noticed whether the edible fish and shellfish have increased, decreased, or stayed about the same during the time you have lived in the tri-county area?@

**Table 11. Comparison of mean length of residency and ANOVA results, by response to the perception of change in fishery resource.**

Perception of Change	Years of Residence	F-Ratio	Significance Level
	Mean		
Stayed same	19.61 <sup>a 1</sup>	6.50	0.0018
Decreased	25.09 <sup>b</sup>		
Increased	29.65 <sup>b</sup>		

<sup>1</sup> Means with different superscripts are significantly different from each other, Duncan's Multiple Range Test, p# 0.05.

## CONCLUSIONS

The residents of the Greater Charleston Area who were included in this study overwhelmingly support protection of the environment. (The only differences in opinions on any of the questions was in the strength of the response.) Respondents feel strongly that environmental resources are important and have serious concerns about specific natural resources. Consequently, they are strongly in favor of the development of a regional management plan that would protect these resources. Although respondents were not specifically asked if they would be willing to pay financially for protection of the environmental resources, several questions did have a cost associated with them. In each instance the respondents were in favor of protecting the resources regardless of the ~~an~~ opportunity cost associated with that protection. This is substantiated by the results of the question that dealt with benefits vs. consequences of development. Only 23% of the respondents agree that the benefits of development and growth outweigh the negative consequences to the environment.

Since the Results and Discussion portion of this report presented the tabulated findings of the telephone survey and the descriptive interpretation and discussion of the major findings and the Executive Summary at the beginning of the report summarized the purpose, methods, and major findings of the research, another summary is not included. Instead, some preliminary conclusions drawn from the data will be offered. The concluding statements are preliminary, since they pertain only to the telephone survey data and thus, are offered in the absence of the environmental assessment data and other information collected by the Charleston Harbor Project.

- F The results are restricted to residents of Berkeley, Charleston and Dorchester Counties and should not be generalized beyond without caution.
- F Very few respondents owned waterfront property (6.6%) or a boat dock (2.6%).
- F Tri-county residents were supportive of resource management and agreed or strongly agreed with the majority of the questions which were related to protection of biological resources.
- F Over 95% of respondents felt that local edible fish and shellfish, and historical and archeological resources are important to the local area, and should be protected through ecologically acceptable growth and development and regional resource management and planning.
- F Residents support tourism and ecologically acceptable growth and development, but only when there is no negative consequence to wetlands, water quality, and safe edible fisheries.
- F Residents find scenic vistas of the Charleston Harbor, marshes, wetlands, forests, streams, and byways to be important resources and support protection of natural vegetation zones.
- F Overall, there were few significant differences in how sub-segments of respondents felt about environmental issues. Any differences found were in strength of opinion only with similar directionality of opinions throughout.
- F College educated residents had stronger positive opinions about resource issues than high school respondents. Amount of college made little difference.
- F Residents over 55 felt less strongly about certain issues than other age groups, possibly due to lower levels of access to the resources themselves.
- F Ownership of waterfront property made a difference, but not on the majority of issues.
- F An equal proportion of residents feel that edible fish and shellfish resources have decreased or stayed the same over time. Only 6% feel they increased. However, many residents felt that they could offer no opinion on this issue.
- F Residents agree that a regional management plan for the tri-county area to protect environment resources while allowing needed growth and development should be developed.

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## **APPENDIX A: COPY OF QUESTIONNAIRE**

### **Charleston Harbor Project Resident Telephone Survey**

Hello. This is \_\_\_\_\_. I'm calling from Clemson University on behalf of the South Carolina Department of Natural Resources. We are conducting a study of the residents of the tri-county area concerning their views of the management of natural resources within the Charleston Harbor area. I can assure you that your answers will be kept strictly confidential and will only be analyzed as part of a group. The interview will take only 8 minutes or so to complete.

Would you be willing to take the time to answer a few questions?

1 = Yes

2 = No

Which county do you live in?

1 = Charleston

2 = Dorchester

3 = Berkeley

I will read you a statement. Please tell me if you strongly agree, agree, disagree, strongly disagree or are neutral about each of the statements.

1. I frequently visit scenic areas within the Greater Charleston area (e.g., beaches, county parks, Cypress Gardens)
2. I frequently visit cultural attractions within the Greater Charleston area (e.g., the Battery Market, Ft. Sumter, Middleton Place)
3. The water in the Charleston Harbor and surrounding rivers and creeks is clean and safe for swimming
4. It is important to me to have locally caught fish and shellfish that are safe for human consumption.
5. I believe the water in the Charleston Harbor and surrounding rivers and creeks will be safe enough to produce a healthy fishery 20 years in the future.
6. Tidal creeks and adjacent wetlands in the tri-county area are being threatened by urbanization.
7. Development restrictions adjacent to tidal creeks and wetlands are necessary to protect local fisheries

8. I would support community boat docks in order to lessen the environmental impact of private individual docks.
9. Some shoreline nesting birds (e.g., brown pelicans, terns, sandpipers) are disturbed during their nesting periods. I would support protection of these habitats even if it means I might not be able to access certain areas during that time.
10. It is important to me that small isolated wetlands be protected even if these are located on my property.
11. The historical and archeological sites in the Greater Charleston area are important to the community and should be protected.
12. Tourism in the tri-county area has improved the economy of the greater Charleston area.
13. I support tourism and would like to see it continue as a major industry in our area.
14. The benefits of development and growth within the tri-county area and Charleston outweigh the negative consequences to wetlands, water quality and fisheries.
15. Growth (new roads, businesses, homes, water and sewer lines, etc.) should be supported only if it is done in a reasonable and ecologically accepted manner.
16. A regional management plan for the tri-county area should be developed to protect our environmental resources while allowing needed growth and development.

Now I would like for you to tell me how important each of the following scenic or cultural resources is to you. Tell me if it is very important, somewhat important, somewhat unimportant, very unimportant or that you are neutral on the issue.

Scenic vistas of Charleston Harbor

Scenic views of marshes and wetlands

Scenic views of forested areas

Greenbelts, or grassy areas, along rivers and streams

Scenic byways and historical trails

Natural vegetation buffer zones are 50 foot grassy areas that maintain water quality and protect fishery habitat and natural areas. How important do you feel it is to develop a regional management plan that would create natural vegetation buffer zones?

Have you noticed whether the edible fish and shellfish have increased, decreased, or stayed about the same during the time you have lived in the tri-county area?

- 1 = Increased
- 2 = Decreased
- 3 = Stayed the same

How many years have you lived in the tri-county area?

Do you own waterfront property?

- 1 = Yes
- 2 = No

Do you have a boat dock on your property?

- 1 = Yes
- 2 = No

Which of the following best describes your employment status?

- Employed
- Retired
- Student
- Full time homemaker

In which of the following age groups do you belong?

- 1 = 18 - 35
- 2 = 36 - 55
- 3 = over 55

Including yourself, how many people reside in your household?

What was the highest level of formal education you completed?

- Less than high school
- High school graduate
- Some college
- College graduate
- Post-graduate/professional degree

Please tell into which of the following income ranges your total household income falls

- Less than \$20,000
- \$20,000 - \$39,999
- \$40,000 - \$59,999

\$60,000 - \$79,999  
\$80,000 - \$100,000

Sex (do not ask unless absolutely necessary)

1 = Male  
2 = Female

## APPENDIX B: COPY OF OPEN COMMENT FROM QUESTIONNAIRE

40000 COMMENT	She would like to see the beauty of the area preserved, yet development is also important.
30000 COMMENT	I worry about the environment.
10000 COMMENT	Get rid of Al gore.
20001 COMMENT	Put more concern in managing the mosquitos rather than the wetlands etc.
20002 COMMENT	Water pollution is a major problem. If you don't have a water system you're basically being poisoned.
60003 COMMENT	Wonder how many people are actually caught for littering our highways and tributaries. She is a counselor in a school and they try to teach them good values, but is there anything being done to the people that are caught.
10001 COMMENT	Ecology is important; we need to protect the habitats without too many restrictions.
10002 COMMENT	no
10004 COMMENT	It is improtant to protect the wetlands but if they are homeowners they should be able to see the view
60005 COMMENT	It is so important to preserve all of nature. The wetlands are so fragile, and anything that is necessary to do to save them must be done.
60007 COMMENT	It is important that people do care, and are doing the studies, the regional management plans are good ideas.
40006 COMMENT	Agrees, helps the government, should help the wetlands.
40008 COMMENT	none
40009 COMMENT	none
40010 COMMENT	none
20007 COMMENT	less question
10005 COMMENT	no
10006 COMMENT	no
10007 COMMENT	Its important that questionnaire is asked over the telephone so that people are aware of the current conditions.
10008 COMMENT	We need developments but we also need to take care of the marshes and wetlands.
30008 COMMENT	It is important to keep in mind while trying to develop Charleston to protect the wetlands.
30009 COMMENT	The environment is important and is glad the survey was done.
40011 COMMENT	Would love to see some bike trails along waterways so people could enjoy the area and get their exercise...would love to go along with conservation.

40012 COMMENT	Think that the North Charleston area has lots of development, that is growing but they should be fixing instead of expanding. Things are being destroyed because of increased development-lots of animal habitat is gone. Roads needs fixed.
10009 COMMENT	no
40013 COMMENT	none
60010 COMMENT	One of the prettiest places I have ever lived and we need to keep it beautiful.
60011 COMMENT	Great that we are doing the survey, hope that it does some good.
30010 COMMENT	I appreciate the call.
10010 COMMENT	no
40014 COMMENT	Very interested in longliner issue. Wanted to know if this study had anything to do with that. Doesn't want more boats but thought maybe there is an overreaction to the issue.
60012 COMMENT	Would like to see the waters and environment taken care of and kept clean.
20010 COMMENT	Lives in an area where there are no wetlands, so could not say much about them.
40015 COMMENT	Feels that preservation of habitat is very important.
40016 COMMENT	Roads and industry are more important than individuals .
10012 COMMENT	no
30014 COMMENT	There is a wide difference of opinon, too much emphasis is placed on the economic development and not enough on the residents.
10014 COMMENT	no
20013 COMMENT	Government gets too involved in too many things, this is suppose to be democracy.
60019 COMMENT	I think the management plan will work, but there have to be people that are willing to go along with it.
10016 COMMENT	no
60022 COMMENT	Thank you for having the neutral option, it was a good buffer for those questions that you had no clue about....
30017 COMMENT	She supports controlled growth Mt. Pleasant has gotten out of hand. She disagreed with the wetland question because the definition of a wetland is not defined very well.
60023 COMMENT	It is encouraging that someone is making a note of these problems, and Clemson is a really good place. Most would agree with me except for those whose pocketbooks are directly affected by this...
50016 COMMENT	Too many laws about what can be done and what cannot be done. Everyone is so busy telling you what to do. "I'll live by God-s laws"
50017 COMMENT	Think its very important and glad to see it addressed (environment). Have seen tourism and overdevelopment get out control-Charleston is too beautiful to let that happen to.
50018 COMMENT	none

50019 COMMENT	none
40025 COMMENT	Need more than tourism for industry, ecology is going overboard. Wetlands are being filled with dirt and that's wrong to build houses. Preservation Society has way too much power.
60028 COMMENT	Wants the results to be published
20021 COMMENT	She's disabled and therefore, isn't able to visit scenic or historical areas; thinks the study is very important.
50020 COMMENT	none
50021 COMMENT	Work in the residential construction, feels that there's more violation of codes to people and environment in that industry than in big industry. Small business pollute and more destruction- someone should recognize this.
60031 COMMENT	Wonderful that we are doing something about this whole issue, someone needs to. The regional management plan is a good idea
40027 COMMENT	Keep it clean
20024 COMMENT	Very important; hope the efforts are continued to preserve the natural environment.
30018 COMMENT	I have seen a large growth in Charleston in five years, we are losing some of the old quality.
10017 COMMENT	no
60033 COMMENT	Too many people out there messing around on the water, when they are not in good shape to do so, they are the ones causing all of the pollution.
20026 COMMENT	Think it is very interesting and loves Charleston. Tourism is very nice, however would not like to see it get to the point where it is overcrowded and out of hand. The grassy areas aren't really grassy but mossy.
10018 COMMENT	We should protect the environment, growth is necessary and it should be done with minimum harm to the environment.
60035 COMMENT	Likes the study, she is interested in the subject and we are building too close to the shore, thus disturbing the wildlife and plants.
30022 COMMENT	She is in favor of keeping things the way they are because she is against the government taking over the lands for any reason. The questions are vague and any generalization can be drawn from the answers.
20028 COMMENT	I support tourism and development as long as it is sustainable development done in a responsible manner. He has a degree in environmental psychology and a real interest in the issues which is why he answered the survey questions.
10019 COMMENT	no
40030 COMMENT	Hate laws but they are needed to regulate. People are overrunning the city and natural resources are being destroyed.

60037 COMMENT The commercial shrimpers have taken a lot of the fish and thrown them out because they are only looking for shrimp. People need to regulate size limits for commercial fisherman. Water stands cause a lot of mosquitos.

10020 COMMENT Appreciate what the SC Wildlife is doing to make sure that the fish and other seafood are safe and healthy.

20031 COMMENT The questions need to explain what the objective/purpose of the study (too vague). It sounds like they are trying to prevent people from owning private docks etc. If people own property they should have the right to do what they want to.

60038 COMMENT Not an environmentalist by any extreme. I love the area, and would do anything to save the marshes and wetlands.

40031 COMMENT Tourism is wonderful but natural resources definitely need to be protected.

40032 COMMENT Tri-county area should work together on conservation efforts.

60039 COMMENT I feel that it is too late in the game to do anything about it now. I hope that your plan works...

20032 COMMENT Scenic routes are very important and make up a huge part of Charleston and the scenery for tourists and school children are a unique way of sharing and experiencing different views.

50026 COMMENT Tourism should be restricted in some areas to protect our environment.

10022 COMMENT Hope that we can develop a balance between development and our natural resources.

10023 COMMENT Think the area is beautiful and think we should and could balance nature and development.

40034 COMMENT Older companies openly pollute--need to be controlled;there is a lack of regard to stopping known pollutants; politically, money talks & they get away with it; newer companies seem to be more concerned about protecting environment.

60041 COMMENT Asked what the study was about, and how we could tell that the harbor water was unsafe.

50027 COMMENT Totally against the longlines-very strongly against it!!! Bad mistake if they let that happen.

10024 COMMENT no

60042 COMMENT By being involved with the Charleston Harbor Project, I know more about these than most people, and some of the issues that we discussed, I have not been convinced that they are as important to the reg. mang. project as before.

50028 COMMENT none

10025 COMMENT Wish that they could figure something out to get rid of the smell from the paper plants.

20034 COMMENT	Charleston was nice and beautiful place. Go on highway 61 and the flowers, trees and scenery are so beautiful.
60044 COMMENT	Shouldn't have any more public or private landings, we need to cut down on the number of boats that are zooming around and polluting the harbor...
40035 COMMENT	Hopes that she helped; has only lived there 3 yrs and hasn't really visited many of the scenic areas, therefore neutral on most.
50029 COMMENT	none
10026 COMMENT	SC Wildlife is very conscious of the wetlands and they are doing very good job protecting the natural resources.
40036 COMMENT	Should restrict tourism, although admittedly it is an important part of the economy; growth also needs to be regulated; thinks this is an important study and hopes that some good will come of it.
60045 COMMENT	If they do put the management plan in, it will be good for the area. Too many people are out there just to abuse what we have
50030 COMMENT	I hope people continue to support the environment.
10027 COMMENT	no
50031 COMMENT	none
40038 COMMENT	Feels that the pollution days are over; he's all for development, but has some concern; however, he feels that proper measures seem to be taking place
10028 COMMENT	no
10029 COMMENT	no
50032 COMMENT	none
50033 COMMENT	Like to see development of buffer zones -all for the wildlife and environment.
60047 COMMENT	The questions make some assumptions that I do not agree with and that might lead those that are not knowledgeable in the area of this study to chose the answers that you want them to..
30032 COMMENT	Anything and everything should be done to save the wetland, growth is important and it should be controlled.
40040 COMMENT	Has not been able to go fishing a lot because of illness, but would like to go more; seemed offended by inquiry about income level--hung up before I could explain that I wasn't selling anything.
50035 COMMENT	Seems that water quality is worse.
40041 COMMENT	It is important that all of these sites and resources are maintained well into the future--for our children's children.
60049 COMMENT	Think that it is very important to save the heritage of the area, when Hugo came through, it cleared out a lot of land that people immediately built up on...

60050 COMMENT	Does believe that it is important to save the animals and wetlands, sometimes they are smarter and more intelligent than we are... people should realize that these are important areas, give respect to animals and leave the areas alone.
40042 COMMENT	Pollution from foreign vessels--needs to be examined and taken care of; he was in the military and believes this problem is being overlooked.
60052 COMMENT	Use common sense.
40045 COMMENT	She wishes that her car would work so that she could go out and enjoy these sights.
40046 COMMENT	Thinks this is very important--took the time to take the survey, from visiting with company.
50039 COMMENT	Something needs to be done, wetlands should be protected.
50040 COMMENT	It was fun!
40047 COMMENT	Concerned about the lake water quality and nuclear waste and great amount of trash on highways; thinks that recycling should be encouraged more.
50042 COMMENT	The income question is completely unnecessary.
60056 COMMENT	Grew up in Wisconsin, first job was with the surveying div. for the state, and twenty years ago, they had one of these plans. Why is it taking so long here?
60058 COMMENT	Good luck... what was it about?
50044 COMMENT	The neutral answers were because not necessary, likes to fish, thinks wildlife used wisely.
40053 COMMENT	Thinks that this is important; supportive and would volunteer to assist in protecting the environment in any way she could--please contact her in the future if programs are developed and need help.
40054 COMMENT	Thinks too much emphasis is placed upon environmental issues, instead of on people; therefore, chose to hang-up in the middle of the survey...
60061 COMMENT	The city will sink if we continue on this way!
60063 COMMENT	Get the mosquito people working harder...
40055 COMMENT	Stressed the importance to take people's answers in context of the questions; in her opinion, if the circumstances were varied, their responses might change
60065 COMMENT	I think that the management plan is wonderful, just because you have money, it doesn't give you the right to throw it around like you like... don't ruin something that has been there long before you were even thought of...
40057 COMMENT	Very concerned about the water, especially all the waste that's being dumped into the lakes; loves the wetlands and other scenic areas of Charleston area
60067 COMMENT	I totally agree with the whole regional management plan... I hope that it will work if it happens...

30035 COMMENT	Efforts to clean things up, especially Ashely River better. Not individuals but industries that are the problem. May have gone too far to accommodate industry, e.g. Westvaco. He is a M.D.
30036 COMMENT	Wanted to know what use the study would be for.
60069 COMMENT	Very positive survey, and thank you for calling me...
10030 COMMENT	no
10031 COMMENT	Preserving wildlife is important to me.
10032 COMMENT	Handling debris such as oil is problem.
60070 COMMENT	Her husband fishes and therefore, this is very important to them; thinks that growth and development needs to be managed.
30038 COMMENT	Get tired of seeing land being cleared for new building when there are empty buildings that could be used. Wetlands should be protected for the public and not just used up by the wealthy who can afford property there.
10033 COMMENT	no
50047 COMMENT	Firm believer of preserving natural resources, especially forest.
40061 COMMENT	They need to do something about West Vaco and other companies that destroy our water.
10034 COMMENT	no
60071 COMMENT	Very rushed; a few times answered question before I completed reading them; however, did hesitate quite awhile on those questions he finally responded with as "neutral".
10035 COMMENT	no
10036 COMMENT	no
50052 COMMENT	I think the people here are over worked and under paid.
40066 COMMENT	none
20047 COMMENT	Coastline and tributaries are being used to benefit the few. He has a problem with the longline fisherman and shrimp boats, they kill a lot of the fish
10038 COMMENT	Growth is important and necessary for the area because it provides, but there must be a balance between growth and our natural resources.
10039 COMMENT	Ashley River is cleaner than it was 20 years ago and tourism generates a lot of revenue but it only benefits a select few; Charleston has gotten too commercial; it is not for the people of Charleston.
40067 COMMENT	Like to see everything be protected-too much is going on with development.
40068 COMMENT	Feel that the port areas should be left alone-feel that if someone owns property they should be allowed to do what they want-like to protect the animals too.
40069 COMMENT	More tourism!!! Study how to make more money-so they can build another bridge. Improve the cultural attractions-Be proud of the Civil War.

20049 COMMENT	They should get rid of the monstrosity of a courthouse and put money into fixing up the area.
40070 COMMENT	none
40071 COMMENT	none
50060 COMMENT	Want more enforcement of laws that we have now.
40072 COMMENT	none
20051 COMMENT	The forestry are doing a good job, the forestry area should continue to grow.
10042 COMMENT	I agree with preserving natural resource; should be better hunting restrictions.
60079 COMMENT	Hope that we are able to accomplish what we want to accomplish.